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THE ASCENDANCY OF SURFACE MINING OVER UNDERGROUND MINING  
IN THE UNITED STATES COAL INDUSTRY  
EFFECTS ON AND ISSUES RELEVANT TO THE UNITED MINE WORKERS OF AMERICA

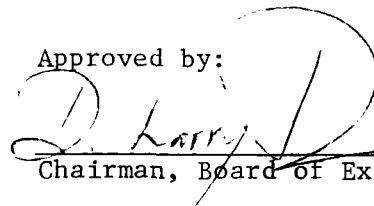
BY

DEBORAH UNDERWOOD

B.A. AND M.A. ANDREWS UNIVERSITY 1970 AND 1971

A PROFESSIONAL PAPER PRESENTED IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF BUSINESS ADMINISTRATION

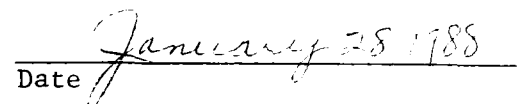
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Thank you to my husband who has proofread each draft of this paper and who now knows more about coal mining than he cares to know.



## INTRODUCTION

The purpose of this paper is to investigate the reasons for an increase in surface mining and a decrease in underground mining and to analyze the effects on the United Mine Workers of America. The research concentrates on the years from 1970 to 1985.

The paper is organized into four chapters with nine supporting tables. Research sources include books, journals and magazines, and United States government documents.

## CHAPTER I

### HISTORICAL PERSPECTIVE

Before the mid-eighteenth century, the history of coal use in the United States is sketchy. There are indications that the Hopi Indians in Arizona may have used coal to fire pottery, and missionaries reported seeing coal used by the Indians and by the French throughout the seventeenth and eighteenth centuries.

During the eighteenth century, historical sources contain increased references to coal. Coal deposits in Pennsylvania, Maryland, and Virginia were mapped, and during the Revolutionary War, the Richmond coal field in Virginia was the main source of fuel for munitions makers. Also in the late eighteenth century, investors began buying United States coal fields for future development.

Despite the increased interest in and use of coal, the United States coal industry did not prosper in the eighteenth century for several reasons.

1. Wood was a plentiful and cheap source of fuel.
2. Mining was done in small quarry pits, and the mechanics of coal mining in the United States were behind the British coal industry which began exporting coal to the colonies in the early eighteenth century.
3. Transportation for coal was limited.
4. Most of the then-available coal was west of the Appalachians.

In the first half of the nineteenth century, the groundwork was laid to exploit the bituminous coal fields in Virginia, Pennsylvania, and Maryland, and the anthracite field in Pennsylvania. During this time, the United States government sold public lands cheaply, lands that were rich in coal deposits. Much of the land had been taken from the Indians or foreign countries. The government also subsidized transportation, thus paving the way for coal to be transported by canal and by railroad.

By the Civil War, the United States' estimated coal output was fourteen million tons per year.<sup>1</sup> After the Civil War, coal was needed for increasing residential, industrial, and transportation uses, and coal mining became a major industry.

Coal is used for a wide variety of purposes. It is used as a fuel to provide heat or make steam or electricity. It is used in the manufacture of pig iron and steel and in tars, drugs, and dyes. Because the primary uses of coal involve generating some type of energy, the coal industry's fortunes have boomed or fallen on hard times as the energy needs of the United States have changed. In recent years, electric utilities have become the nation's foremost coal consumers. Coal production figures from 1985 show that for domestic markets electric utilities consumed eighty-five percent, coking coal consumed five percent, and general industry and retail consumed ten percent.<sup>2</sup>

Four types of coal are mined in the United States.

1. Peat, a partially carbonized vegetable tissue.
2. Lignite, subbituminous, and brown coal, an intermediate low-quality coal between peat and bituminous.

3. Bituminous coal, the most common and useful.
4. Anthracite, a high quality coal that burns easily.

There are many other ways to classify coal, and for the purposes of this paper, two need to be mentioned. Metallurgical coal, a coal that melts and fuses to form coke, is used in the manufacture of pig iron and steel. Steam coal, a coal high in heat content, is used primarily by electric utilities.<sup>3</sup> Although both are primarily bituminous coal, some metallurgical coal comes from anthracite fields. Steam coal increasingly comes from subbituminous and lignite coal fields.

Before 1840, the basic mining method in the United States was quarrying or trenching, a forerunner of surface mining. An outcropping of coal signalled the place to begin a quarry. Digging was done by hand, and the coal was carried out by hand. No sophisticated tools or mining techniques were needed. However, coal owners wanted access to the more plentiful underground coal. As the woodlands began to decrease and it was evident that wood could not be an unending source of fuel and as the English monarchs were no longer able to discourage local mineral production, entrepreneurship began to flourish in the form of an American coal industry.

Underground mining in the United States began in the early nineteenth century, using mining technology borrowed from Britain. "By the 1820's shaft mines, which tapped coal seams as deep as 350 feet or more, were used in Virginia."<sup>4</sup> Miners used picks, augers, and shovels to dig the coal in underground tunnels. Early underground mining methods consisted of digging deep shafts and long tunnels. The rock roof was propped up with timbers, the water was pumped out, and natural ventilation

was used.

The miner lay on his side and picked out a four-foot-deep V-shaped incision at the bottom on the coal face across the width of the tunnel. He wedged down the overhanging coal with a metal bar and loaded the lumps, leaving the "slack" on the mine floor. By the 1930s, blasting replaced the laborious "barring down" of the coal. With the face undercut, the miner drilled holes into the overhanging coal, loaded them with gunpowder or dynamite, tamped the charges with clay, backed away, shouted "Fire in the hole!" and lit the fuse.<sup>5</sup>

Modern underground mining is done in one of three basic ways: conventional, continuous, or longwall and shortwall. In all these methods, the mine is accessed by one or more shafts used to move employees, equipment, coal, and air.

The first two methods, conventional and continuous, are both room-and-pillar methods. In this method, coal is removed in a systematic pattern of underground rooms. After the coal is removed, pillars are left to support the roof.

Conventional mining is the oldest currently used underground mining method. In conventional mining, six different machines are used in sequence to mine the coal: cutter, drill, loader, two shuttle cars, and roof-bolting machine. The cutting machine cuts holes into the face of a coal seam. Explosives are placed in the hole and detonated. After the coal face has crumbled, the coal is loaded, and support timbers or roof bolts are put in place.

In the continuous mining method, a one-man machine combines the functions of cutting, drilling, blasting, and loading. As in conventional mining, roof bolts or timbers support the roof.

Longwall mining is used on long coal panels. In this method, a "cutting drum or coal plow is winched along the face from the ends."<sup>6</sup>

The equipment uses self-advancing jacks and is followed by roof-bolting equipment. Shortwall mining is similar to longwall mining, but it is used where the coal face is smaller.

Although the first mining done in the United States was the forerunner of strip mining, strip mining itself did not begin until the mid-nineteenth century. Strip mining or surface mining is used to mine coal located near the surface of the earth. The first strip mining was done with horsedrawn plows, scrapers, wheelbarrows, and carts.

There are three basic steps in modern surface mining. First, the earth or overburden covering the coal seam is removed. Second, the coal is dug using primarily earth-moving equipment: large shovels, bulldozers, trucks etc. Land reclamation to restore the land to the original or an acceptable condition is the final step.

Strip mining is usually done in one of two ways, area or contour mining.

Area mining is done on flat or gently rolling land. A trench is cut through the overburden, exposing the coal seam. A series of parallel trenches is made, and after the coal is removed from the trench, the earth from each cut is placed in the trench already excavated.

In area mining, the stripping is done by power shovel, dragline, or bucket wheel. Draglines usually dig from a position on top the overburden or on a trench cut into it while shovels usually dig from on top the coal seam.

The bucket wheels used in strip mining of coal are long bridge

structures that may stand on top of the coal seam or on a bench in the undisturbed overburden. The digging wheels are on fairly short booms, which are extensible and retractable. The rest of the structures are rigid and simply provide support for conveyor belts that carry the spoil from wheels to the spoil areas.<sup>7</sup>

Contour mining is done on hilly or mountainous land where the coal lies in horizontal, thin seams. Starting with an outcrop of coal, the coal seam is mined at the same level along a hillside or mountainside. Mining equipment for this method is smaller than for area strip mining. In both area and contour strip mining, explosives may be used to prepare the overburden for easier removal and to fracture the coal itself.

## CHAPTER II

### SURFACE MINE PRODUCTION SURPASSES UNDERGROUND MINE PRODUCTION

Although underground mining in the United States began approximately fifty years before surface mining, most of the coal mined in the United States today comes from surface mines. In 1940, approximately one hundred years after surface mining began in the United States, coal mined by underground methods accounted for 90 percent of coal production.<sup>8</sup> The percentage gradually decreased until in 1970, only 56 percent of the coal came from underground mines and 44 percent came from surface mines.

This paper analyzes the coal mining industry from 1970 to the present. In 1971, the production was approximately fifty-fifty, and through 1973, the percentages hovered in that range. In 1974, surface mined coal surpassed underground coal 54 percent to 46 percent, and by 1984, the percentages were approximately 57 percent to 43 percent in favor of surface mining. Table I shows the percentage of total coal production mined by both underground and surface methods from 1970 to 1985.

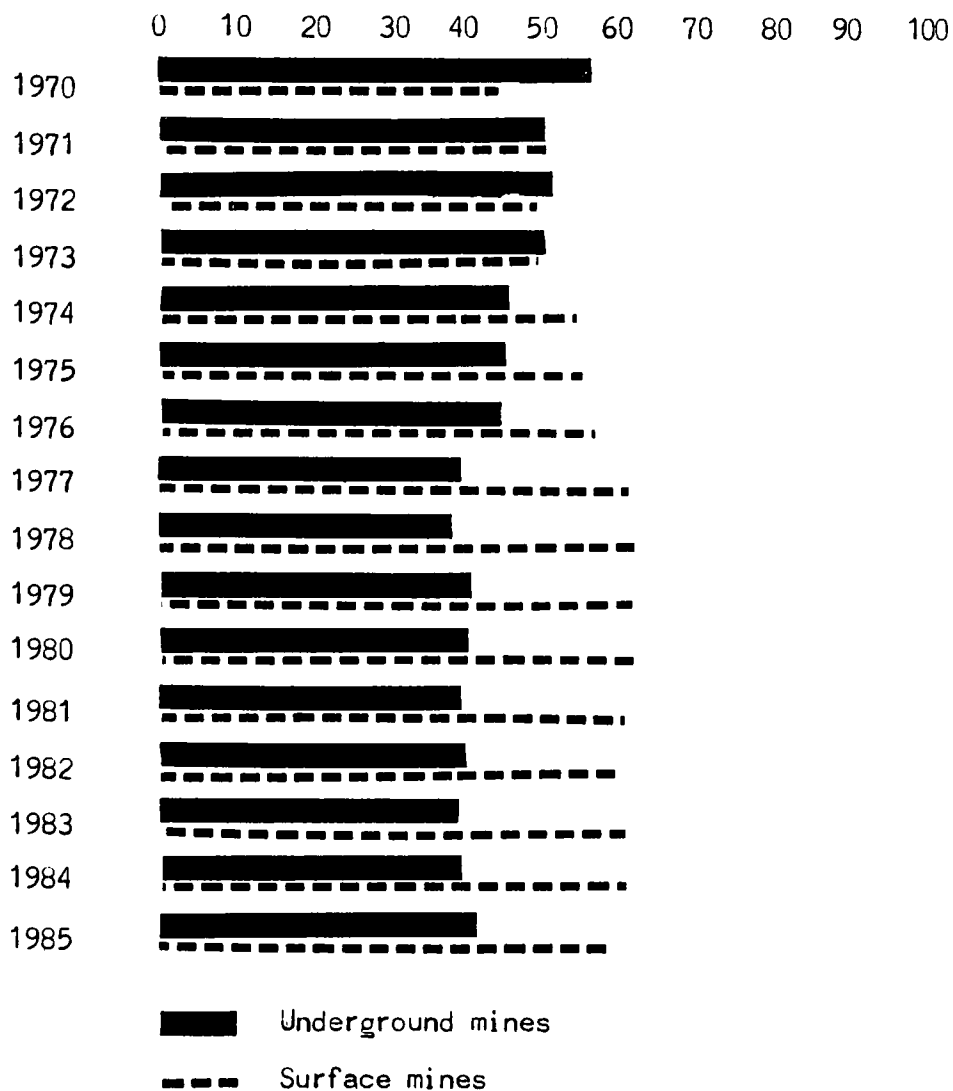
There are several interrelated reasons why coal production from surface mines has increased and coal production from underground mines has decreased.

One major reason for the change is that the demand for steam coal has increased dramatically in recent years. While steam coal is



Table 1

COAL PRODUCTION IN UNDERGROUND AND SURFACE MINES, 1970-1985  
(By percentage of total coal production)



Source: Mining Informational Services. Keystone Coal Industry Manual. 1974, 1976, 1980, 1982, 1983. New York: McGraw-Hill; U. S. Department of Commerce, U. S. Bureau of the Census. Statistical Abstract of the United States 1987. Washington, D. C.: Government Printing Office, 1986.

used for a variety of purposes, it is used primarily by electric utilities. In 1950, electric utilities accounted for 18.6 percent of United States coal consumption, coke plants 21.8 percent, industrial plants 36.3 percent, and residential users 23.3 percent.<sup>9</sup> Over a thirty-five year period, this situation changed until in 1985, electric utilities consumed 85 percent, coke plants 5 percent, and general industrial and retail users 10 percent.<sup>10</sup>

While electric utilities were increasing their use of coal, other consumers decreased their use. The domestic market for metallurgical coal or coking coal, the coal used in steelmaking, has decreased because coking coal can be imported more cheaply than it can be mined. Also, the United States steel industry has been experiencing a recession, thus decreasing the demand for coking coal whether it is domestically produced or imported.

Industrial and residential users have turned to oil, natural gas, and electricity, which are all cleaner and easier to use than coal, and the railroads, a formerly large coal consumer, no longer power locomotives with coal.

It is apparent that coal companies will produce whatever coal the utilities use, and since surface mined coal is primarily steam coal, the demand for surface mined coal increased when the demand for steam coal increased.

However, an increase in the demand for steam coal must be coupled with other factors to understand the increase in the demand for surface mined coal.

One of these factors is the effect of the Clean Air Act Amend-

ments of 1970 and 1977. The amendments set air quality limits for major pollutants, including sulfur oxides, nitrogen oxides, and particulates. Performance standards were set for coal and other fuel fired utilities and industrial boilers. If the sulfur emissions are not within acceptable range, coal scrubbers must be used, thus increasing the cost to the coal producer.

Surface mines in the western United States have benefitted from the Clean Air Act Amendments because some surface mined western coal is much lower in sulfur content than surface mined eastern coal or coal mined underground.

In summary, the western coal fields are characterized by:

1. Relatively thick seams
2. Low heating value
3. Low sulfur content
4. Shallow burial of large reserves.<sup>11</sup>

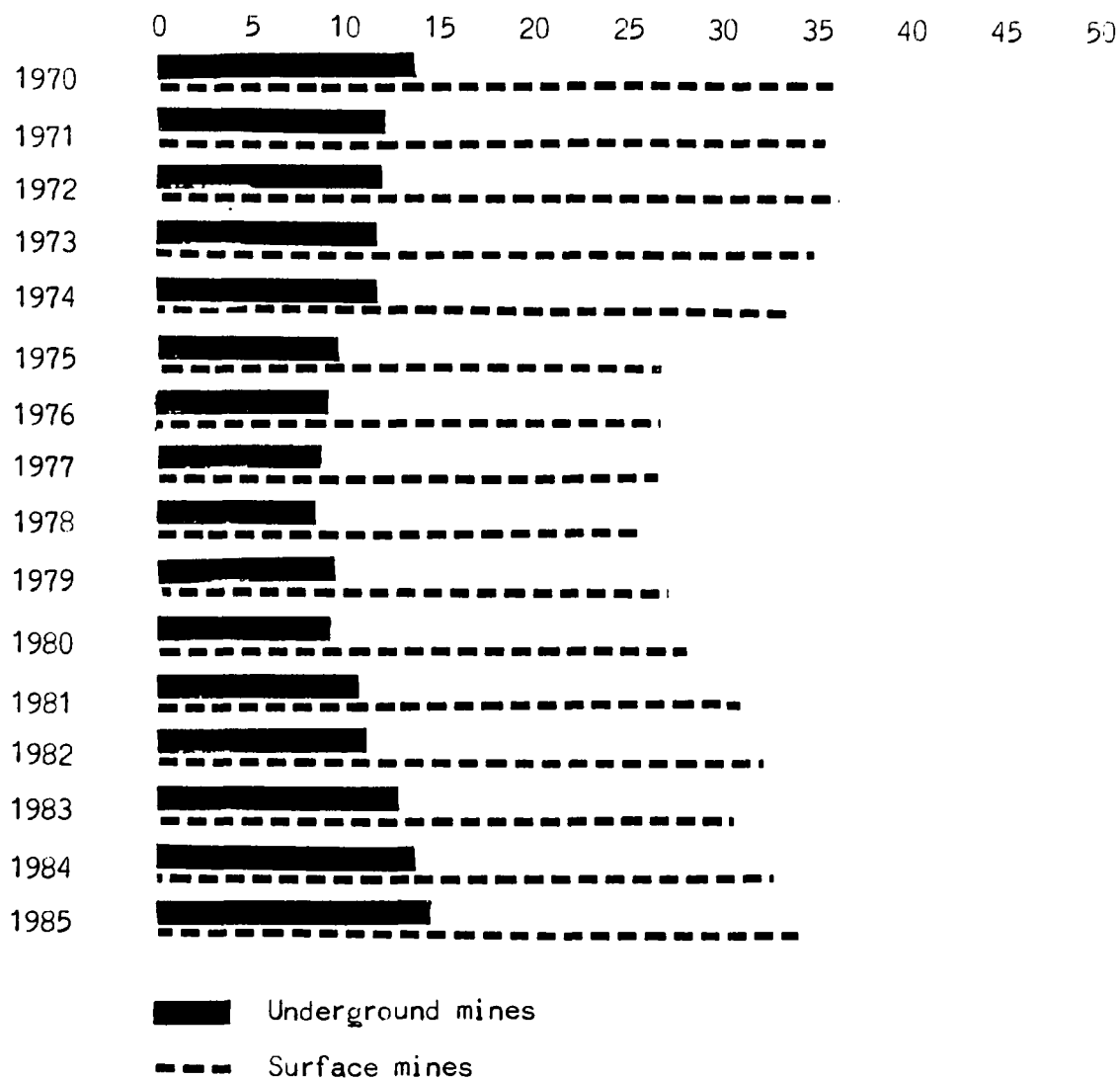
When some surface mines increase their production because of the demand for low sulfur coal, the overall percentage of surface mined coal increases.

With the above four factors, it is easy to see how western surface mines can competitively produce coal. Much of the western coal can be reached fairly easily because it is shallowly buried, and the seams allow a considerable amount of coal to be produced in one place.

Another reason for the increase in surface mining is that surface mined coal has a productivity advantage over coal produced per miner-day. From 1970 to 1985, surface mine productivity ranged from more than double to approximately triple that in underground mines. Table 2 gives productivity figures for underground and surface mines for that

Table 2

PRODUCTIVITY IN UNDERGROUND AND SURFACE MINES, 1970-1985  
(Short tons per man per day)



Source: Mining Informational Services. Keystone Coal Industry Manual. 1974, 1976, 1980, 1982, 1983. New York: McGraw-Hill; U. S. Department of Energy, Energy Information Administration. Coal Production. 1983 DOE/EIA-0118(83), 1985 DOE/EIA-0118(85).

time period. As an example, in 1970 underground mines produced 13.76 short tons per miner-day while surface mines produced 35.96 short tons per miner-day. In 1980, underground mines produced 9.86 short tons per miner-day and surface mines produced 28.32 short tons per miner-day.

Two factors help put the productivity statistics into perspective. First, the productivity statistics are averages, and while they show that on-the-average, surface mines have higher productivity than underground mines, this does not mean that all underground mines are not operating efficiently and all surface mines are efficiently producing coal. Actual productivity figures can be far from the averages.

As an example of how far productivity averages can differ from figures for actual mines or regions, three states' productivity figures were far above the average in 1985. Montana produced 117.84 short tons per miner-day, Wyoming produced 114.72 short tons per miner-day, and North Dakota produced 91.20 short tons per miner-day. Two states, Tennessee and Pennsylvania, produced the lowest averages. Tennessee produced 12.08 short tons per miner-day, and Pennsylvania produced 13.20 short tons per miner-day.<sup>12</sup>

The second factor is that coal producers do not receive the same price for coal mined in surface mines as they do in underground mines or for coal mined in the west as they do in the east. In 1985, coal mined in underground mines brought \$43.91 per short ton, and coal mined in surface mines brought \$20.13 per short ton. Surface mined eastern coal brought \$28.91, and surface mined western coal brought \$13.59. Coal mined east of the Mississippi averaged \$31.44 per short

ton, and coal mined west of the Mississippi brought \$14.57 per short ton.<sup>13</sup> Again, average figures are used.

Even though surface mined coal does not bring as high a price as coal from underground mines, it still has an advantage when productivity is taken into account. In 1985, if one surface miner produced the average 33.92 short tons and if that coal sold for the average surface mine price of \$20.13, the amount totaled \$682.81. If one underground miner produced 14.24 short tons and if it sold for the average underground price of \$43.91, the amount totaled \$625.27. Even though coal mined west of the Mississippi brought only \$14.57 per short ton, if that coal was from a mine producing 91.20 short tons per miner-day as in North Dakota, the total amount for one miner-day would be \$1,328.78. Clearly, surface mined coal has a productivity advantage over coal mined underground even when the lower price for surface mined coal is taken into account.

While for the purposes of this paper, average figures are used for the east and for the west with the Mississippi as a dividing line, coal mining statistics can also be divided into three regions--Appalachian region, interior region, and western region. Table 3 compares these three regions in terms of percentage of national coal production, average days worked, number of mines, average price per short ton, and productivity.

Clearly, the Appalachian region has the largest percentage of national coal production, the largest number of mines, and the highest price per short ton. However, it has the lowest number of days worked and the lowest average short tons produced per miner-day. The interior

region produces the smallest percentage of coal, but it surpasses the Appalachian region with average days worked and average short tons per miner-day. In contrast to both the Appalachian and the interior regions, the western region, with the smallest number of mines and the lowest average price per short ton, has the highest number of days worked and the highest productivity in terms of average short tons per miner-day.

There are many factors affecting productivity in both underground

Table 3

## COMPARATIVE STATISTICS FOR COAL MINING REGIONS

|  | Appalachian | Interior | Western |
|--|-------------|----------|---------|
| Percentage of national coal production | 48.3%       | 21.3%    | 30.4%   |
| Average days worked                    | 201         | 222      | 239     |
| Number of mines                        |             |          |         |
| Total                                  | 2,962       | 278      | 115     |
| Surface                                | 1,369       | 216      | 75      |
| Underground                            | 1,593       | 62       | 40      |
| Average price per short ton            | 32.35       | 24.40    | 14.53   |
| Average short tons per miner-day       |             |          |         |
| Total                                  | 15.20       | 22.48    | 68.40   |
| Surface                                | 18.88       | 27.68    | 86.64   |
| Underground                            | 13.68       | 15.76    | 19.68   |

Source: U.S. Department of Energy, Energy Information Administration. Coal Production 1985. DOE/EIA-0118(85), 1986.

and surface mines. In underground mines, some of the factors are seam thickness, floor and roof conditions, size of operations, age of mine, technology in use when the mine was developed, and reject materials. In surface mines, some of the factors are the nature and depth of the overburden, age of the operation, the technology employed, and reject materials.

Surface mine coal producers have been able to manage a higher productivity level with the factors they have to work with than have underground coal producers.

Another factor affecting underground mine productivity is the regulations imposed by the Coal Mine Health and Safety Act of 1969 (CMHSA) and the Federal Mine Health and Safety Amendments Act of 1977. In order to comply with these regulations "nonproducing workers have had to be hired: ventilation men, maintenance men, cleaning men, roof-bolting men and supervisors."<sup>14</sup> This reduces the tonnage produced per employee and adds to the cost of producing coal.

CMHSA and the amendments have not only affected the productivity, but they have contributed to a general increase in surface mining and a decrease in underground mining.

Regulations establish detailed health and safety standards for underground and surface mines and preparation plants. Miner health is protected by dust and noise standards. There are regulations for ventilation, roof control, rock dusting, electrical equipment, and clean-up. Regular inspections, training, and medical surveillance are provided.

While CMHSA and the amendments are intended to improve mine



safety in both underground and surface mines, compliance with the regulations is more difficult and costly for underground coal producers than for surface coal producers.

For several years after 1969, underground mines decreased in number as many small coal producers were unable to comply with the regulations. Some underground coal producers chose to convert their operations to more profitable surface mines rather than comply with the regulations.

Thus, CMHSA and the amendments not only cut down on underground mine productivity, but they also resulted in less underground produced coal as coal producers looked elsewhere for more profits.

While compliance with CMHSA and the Amendments largely affects underground mining operations, the Surface Mining Control and Reclamation Act of 1977 (SMCRA) regulates certain aspects of surface mining.

SMCRA requires detailed permit applications, including information on environmental data, geology and water, mining and reclamation. It requires backfilling, grading, topsoil replacement, and revegetation. The water quality must be restored to pre-mining levels and sediment and acid runoff must be controlled. The construction of haulroads, spoil disposal areas, dams, and other mine facilities must meet design and performance standards. The Office of Surface Mining (OSM), regulators of this act, require states to have procedures for designating lands as unsuitable for mining.

While SMCRA has added cost to surface mined coal, the cost has not been enough to deter many surface mine operators. However, in the past SMCRA has not been well enforced. If OSM strictly enforces

SMCRA, the costs could increase for surface coal producers and offset some of the advantage they have from the CMHSA regulations.

One reason that underground coal producers had to invest more capital to comply with the health and safety regulations is that underground mining is not as safe an operation as is surface mining. The increased safety factor in surface mining has also attracted some coal producers to surface mining.

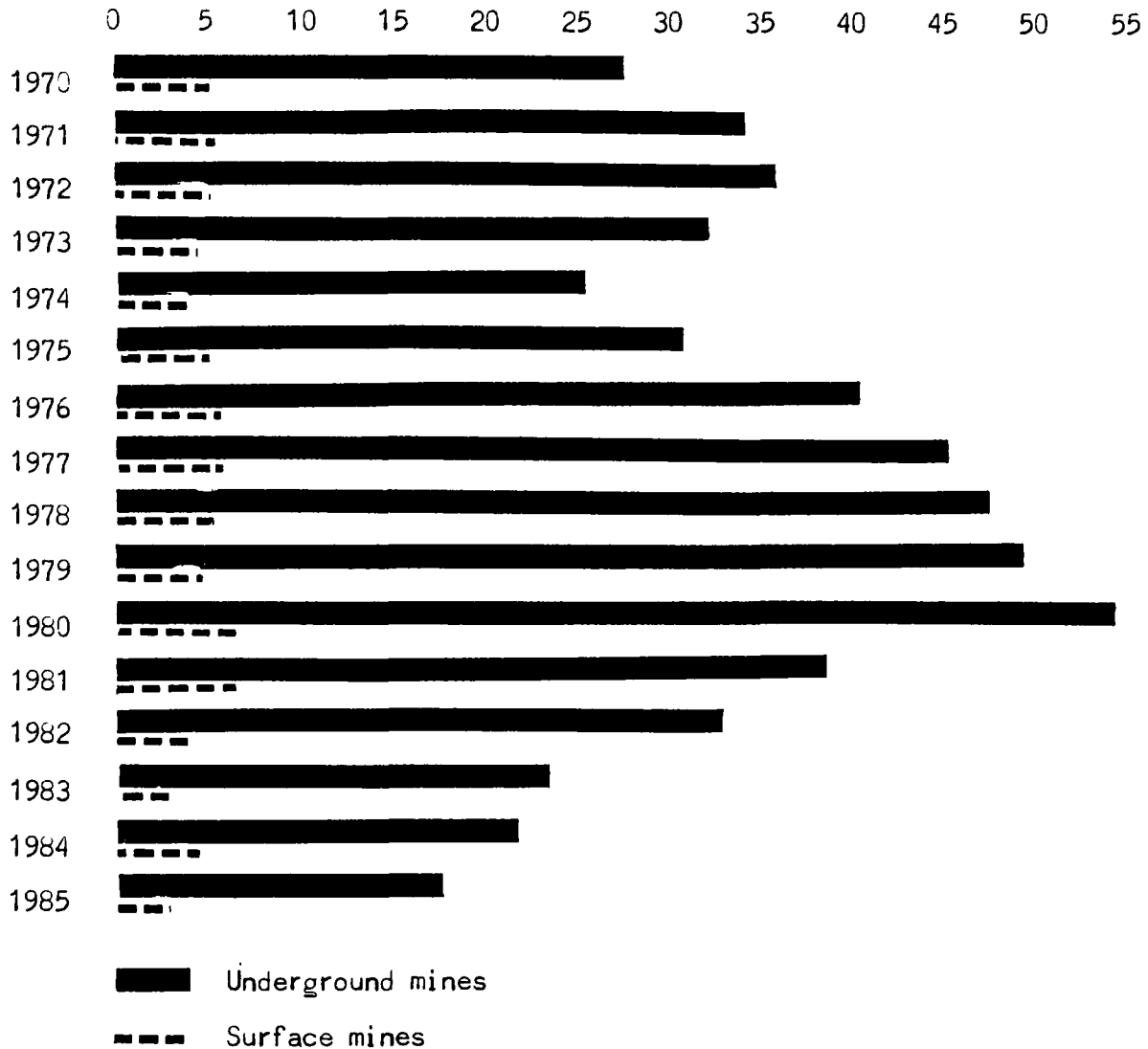
There are safety hazards in both underground and surface mines. In underground mines, the main safety problems are fall of roof, face or back; haulage, machinery and electrical accidents; black lung; and explosions. These and other hazards make underground mining one of the most hazardous industries in the United States. In surface mining, the primary hazards are in materials handling, power haulage, machinery, and slips and falls, conditions that are no more hazardous than those in many outdoor production situations.

Table 4 compares the disabling injuries from 1970 to 1985 in underground mines with those in surface mines. A disabling injury is an injury which results in the loss of one or more work days. Table 5 compares the fatal injuries in underground mines with those in surface mines for 1981-1985.

As an example comparing the safety record between surface and underground mines, there were 121 fatal accidents and 12,187 disabling injuries reported in underground mines during 1981. The disabling injuries per million tons of coal mined were 33.69. In that same year, fatal accidents in surface mines totaled 21 and disabling injuries 3,258. The disabling injuries per million tons of surface

Table 4

DISABLING INJURIES IN UNDERGROUND AND SURFACE MINES, 1970-1985  
(Per million tons of coal mined)



Source: President's Commission on Coal. Coal Data Book. Washington, D. C.: U. S. Government Printing Office, 1980; Perry, Charles R. Collective Bargaining and the Decline of the United Mine Workers. Philadelphia: University of Pennsylvania, 1984; U. S. Department of Labor, Mine Safety and Health Administration. Injury Experience in Coal Mining. 1981 IR 1138, 1982 IR 1143, 1983 IR 1170, 1984 IR 1182; U. S. Department of Labor, Mine Safety and Health Administration. Mine Injuries and Worktime Quarterly. ASI/MF/3, 1987.

mined coal were 6.49.

Clearly, surface mines have a superior safety record over underground mines.

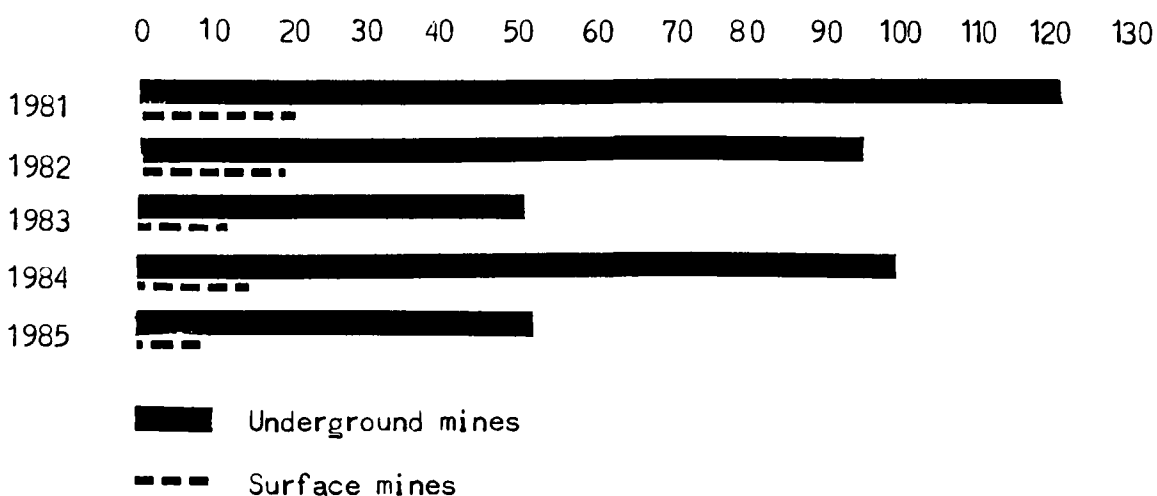
Lower cost of investment capital and lower production costs are important reasons why many coal producers choose to produce surface coal rather than coal mined underground.

Table 6 compares the capital investment costs and Table 7 the production costs for three underground and three surface mines of varying sizes. Costs are based on mid-1977 prices, assume a twenty-year mine life, and do not include loading and cleaning facilities.

Table 6 shows that of the six mines, the highest capital investment per annual ton of production is for a surface mine producing

Table 5

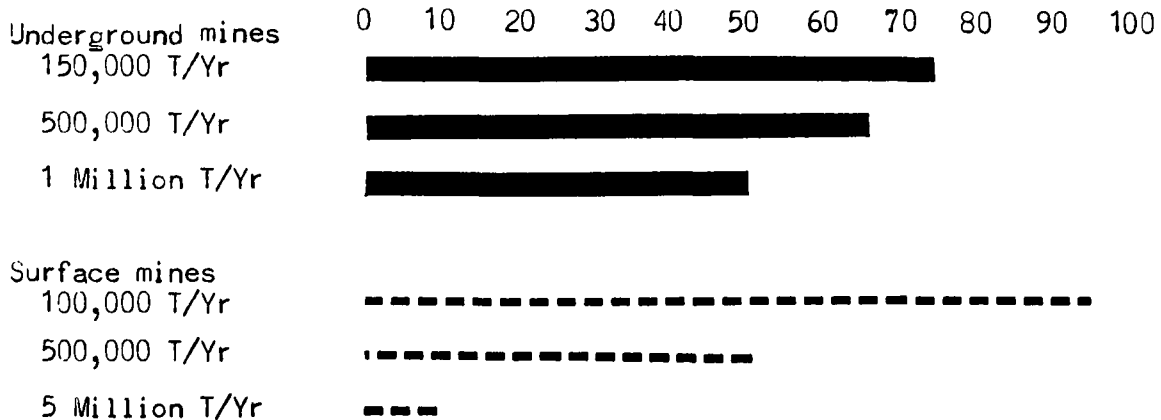
#### FATALITIES IN UNDERGROUND AND SURFACE MINES, 1981-1985



Source: U. S. Department of Labor, Mine Safety and Health Administration. Injury Experience in Coal Mining. 1981 IR 1138, 1982 IR 1143, 1983 IR 1170, 1984 IR 1182; U. S. Department of Labor, Mine Safety and Health Administration. Mine Injuries and Worktime Quarterly. ASI/MF/3.

Table 6

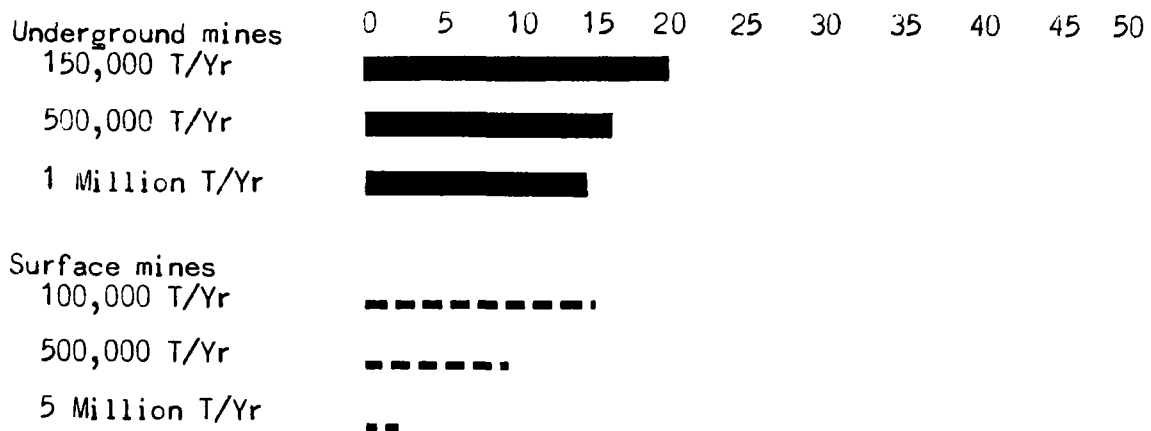
TYPICAL UNDERGROUND AND SURFACE MINE INVESTMENT COSTS  
(Investment per annual ton)



Source: U. S. Department of Energy, Energy Information Administration. Economic Analysis of Coal Mining Costs for Underground and Strip Mining Operators, by Sidney Katell. HCP 176018-01. Washington, D. C.: Government Printing Office, 1978.

Table 7

TYPICAL UNDERGROUND AND SURFACE MINE PRODUCTION COSTS  
(Production cost per annual ton)



Source: U. S. Department of Energy, Energy Information Administration. Economic Analysis of Coal Mining Costs for Underground and Strip Mining Operators, by Sidney Katell. HCP 176018-01. Washington, D. C.: Government Printing Office, 1978.

only 100,000 tons of coal per year. Economies of scale prevail for both surface and underground mines, so that the largest underground mine, producing one million tons per year, required a capital investment of only \$50.27 per annual ton, and the smallest, producing 150,000 tons per year, required \$74.32. The smallest surface mine studied required a capital investment of \$95.59, while the largest surface mine, producing five million tons per year, required a capital investment of only \$10.53 per annual ton of production. Comparing the underground mine and surface mine each producing 500,000 tons per year, the underground mine required \$65.33 per annual ton of production and the surface mine only \$51.18.

Production costs per annual ton for underground mines ranged from a high of \$19.73 to a low of \$14.15. For surface mines, production cost per annual ton ranged from a high of \$15.16 to a low of \$2.29. Comparing the two mines producing 500,000 tons per year, the underground mine required \$16.40 per annual ton, and the surface mine required \$8.98 per annual ton.

With the lower capital investment and production costs for surface mines producing equal tonnage or higher, it is easy to see why many coal producers choose to invest in surface mines rather than underground mines.

In summary, several factors have combined to cause an increase in the percentage of coal mined in surface mines and a decrease in coal mined in underground mines.

1. An increase in the demand for steam coal for electric utilities.
2. The regulations imposed by the Clean Air Act Amendments,

resulting in a demand for low-sulfur coal.

3. The productivity advantage of surface mines over underground mines.

4. The regulations of the Coal Mine Health and Safety Act, resulting in a higher compliance cost for underground coal producers.

5. The safety advantage of surface mines over underground mines.

6. Lower capital investment and production costs for surface mines.

## CHAPTER III

### EFFECTS OF SURFACE MINING ON THE UNITED MINE WORKERS OF AMERICA

The percentage of employees in the United States who are members of unions has been on the decline for a number of years.

The organized labor movement lost 2.7 million members among employed wage and salary workers between 1980 and 1984. . . . Because this decline took place while the nation's workforce grew, the proportion of employed wage and salary workers who were union members declined during the period, continuing a trend that began in the late 1950's.<sup>15</sup>

In 1970, approximately 30 percent of employees in the United States were union members.<sup>16</sup> In 1984, only 19 percent of all employees belonged to a union.<sup>17</sup>

The mining industry was no exception to the nationwide decline in union membership. In 1980, 32 percent of wage and salary workers were union members. In 1984, that had declined to 17.9 percent. "Within the goods-producing sector, the mining industry suffered the largest proportional loss of working union members, 43 percent."<sup>18</sup>

The United Mine Workers of America have been experiencing the same difficulties as have other unions. Because UMWA membership figures as a percentage of U.S. coal miners are not available over an extended period of time, Table 8 shows how the UMWA's share of total national coal production has declined in recent years. In 1970, UMWA members mined almost 75 percent of United States coal production. In 1985, they mined only 36.5 percent.

While it is not possible to state how much of this decline is



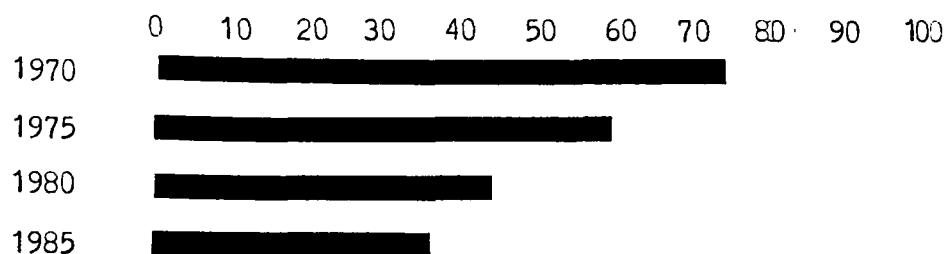
attributable to high productivity in non-union mines such as those in the Powder River Basin in Wyoming and how much is due to a decline in UMWA membership, industry analysts agree that, along with other unions in the United States, the UMWA's influence and power have declined.

The decline of union influence in the United States in general and the decline of UMWA influence in particular reflects a complicated set of circumstances. While not wanting to appear simplistic, Chapter III will concentrate on one factor of many--the effect that the increase in surface mining has had on the UMWA.

In 1977, the Mine Enforcement and Safety Administration (MESA) conducted a survey which resulted in Union Organization in the Bituminous Coal Industry. According to this survey, as shown in

Table 8

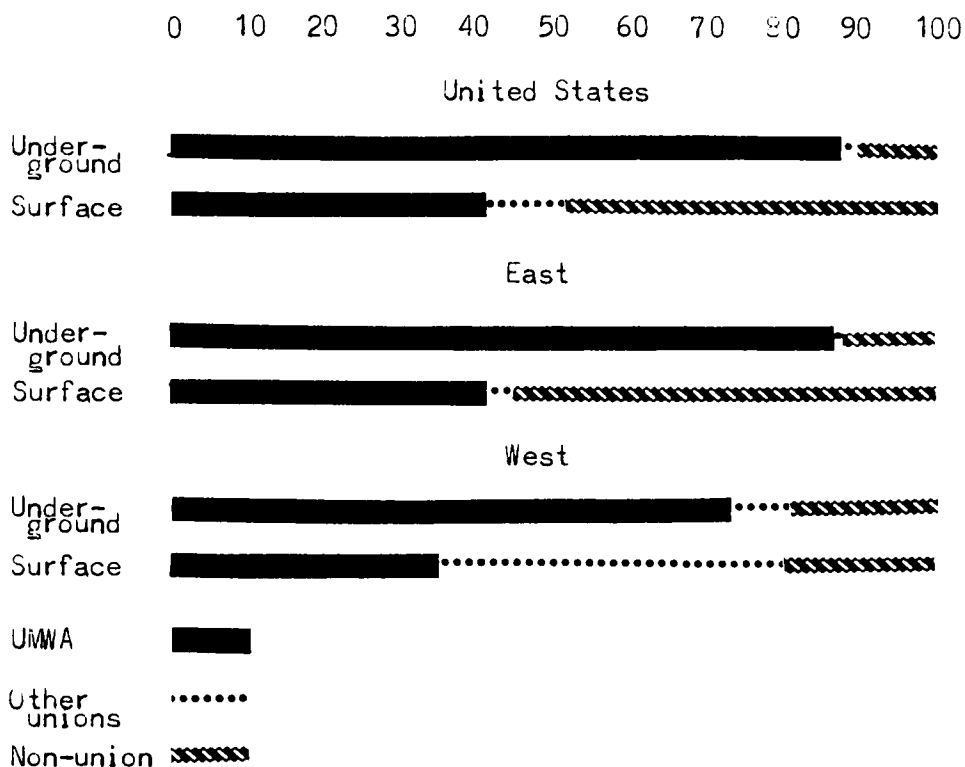
#### UMWA'S SHARE OF TOTAL NATIONAL COAL PRODUCTION, 1970-1985



Source: Curtis, Carol A. "A Shadow of its Former Self." Forbes, October 22, 1984, pp. 162-164; Standard and Poor's. Industry Surveys. New York: Standard and Poor's Corporation, 1987.

Table 9

UNION ORGANIZATION IN THE BITUMINOUS COAL INDUSTRY 1977  
(By percent of total employment)



Source: President's Commission on Coal. Coal Data Book. Washington, D. C.: U. S. Government Printing Office, 1980.

Table 9, 87.4 percent of all underground coal miners belonged to the UMWA, 2.2 percent belonged to other unions, and 10.4 percent were non-union. Surface coal miners who were UMWA members comprised 41.5 percent, 10.2 percent belonged to other unions, and 48.3 percent were non-union. Table 9 also demonstrates that the eastern mines were more heavily organized by the UMWA than were the western mines and that a smaller percentage

of western surface miners belonged to the UMWA than did eastern surface miners, eastern underground miners, and western underground miners.

There have been no recently published surveys to compare the results of the 1977 MESA survey. However, industry analysts and writers on the coal industry indicate that the same general condition still exists. The UMWA is weak in organizing surface coal miners and especially, western surface miners. "Although U. S. coal production shifted westward, the union failed to organize workers at those mines."<sup>19</sup>

While the UMWA, with an active membership of 100,000 workers still represents nearly 60% of the industry's miners, its weakness in the West has meant that a strike threat no long instills fear in the nation's electric utilities. Though a large number of surface coal miners are non-union, many belong to rival labor organizations, such as the Progressive Mine Workers of America and the International Union of Operating Engineers.<sup>20</sup>

There are several reasons why increased surface mining has affected the UMWA.

In the past, the UMWA has worked for two main goals--higher wages and better health and safety standards. "Coal labor disputes have been marked on the one hand by the miner's struggle to make a decent living in safe conditions and on the other by mine owners and investors seeking a return on their investments."<sup>21</sup>

While adequate wages and safe working conditions are important to all miners, circumstances cause some miners to be less receptive to the UMWA's appeal to those issues as they have been in the past.

Chapter 11 demonstrated that surface mines have higher productivity

and a better safety record than underground mines. Much of the higher productivity takes place in western surface mines. The higher productivity of mountain states surface mines enables non-union miners in that area to earn an average of 5 percent more than union miners in mountain states surface mines.<sup>22</sup>

The average higher wages for non-union miners in mountain states surface mines needs to be linked to the growth in both surface mining and mountain states mining, both of which are experiencing large production employment growth. From 1976 to 1982, surface mining's production employment growth was 43 percent while the growth in underground mining was 17 percent. In the mountain states, the work force more than doubled in both underground and surface mines.<sup>23</sup> With the increased size of the work force in western states and in surface mining and with the western non-union surface miners receiving an average higher wage than the union worker, there are quite a number of western surface miners who might not feel the need to join the UMWA in order to receive higher wages.

Chapter 11 also focused on surface mining's superior safety record. Since surface mines have fewer fatalities and fewer disabling injuries than underground mines, this lessens a surface miner's need for a union that will push for increased safety standards in the mines. Black lung, a hazard in underground mining and a rallying point for the UMWA, is not a concern for surface miners.

Another factor in the UMWA's decreasing influence, particularly in western surface mines, is that the strong tradition of UMWA membership among eastern underground miners has not been transferred to

the west. In the east, union membership and UMWA loyalty has been passed from father to son since the early days of the UMWA in the United States. If the younger generation ever doubted the effectiveness and importance of the UMWA, there was an older generation to extoll the union's accomplishments and tell and retell the stories of successful strikes and unsympathetic management. However, when the coal mining industry moved westward that UMWA loyalty did not always move with it. Perhaps it was because those who sought their fortunes in the west were not as bound by tradition as were those they left in the east or perhaps it was because the widely separated western mines made it more difficult for union organizers to build a cohesive group or even get the miners together as a group. But for whatever reason, the UMWA traditions have never been as strong in the west as in the east.

The dissimilarity between underground mining and surface mining jobs offers perhaps the most important explanation for why the surface miner has not been as interested in the UMWA as the underground miner. Surface mining is primarily an earth-moving operation, and surface mining jobs are more similar to those in the construction industry than to those in underground mining.

Among the key jobs in deep mines are mechanical-cutting and loading-machine operator, continuous-mining machine operator and roof bolter; In contrast to surface mines where the key jobs are power-shovel operator, bulldozer operator, and truck driver. The basic difference between the two is perhaps exemplified by the fact that within surveyed employment the most important occupation in terms of number of workers is roof bolter in deep mining and bulldozer operator in surface mining.<sup>24</sup>

This difference in surface mining and underground mining jobs,

coupled with the UMWA's traditional concentration on underground mining issues make unions other than the UMWA attractive to surface miners. The 1977 MESA survey showed that only 2.2 percent of unionized underground miners belonged to a union other than the UMWA, while 10.2 percent of surface miners belonged to another union. Among western surface miners, 45 percent belonged to a union other than the UMWA.<sup>25</sup>

It appears that the same situation exists today.

Though a large number of surface coal miners are non-union, many belong to rival labor organizations, such as the Progressive Mine Workers of America and the International Union of Operating Engineers. The UMW's lack of success in organizing western coal miners largely stems from the marked difference in the working environment between an underground and surface mine. Surface miners don't identify with the UMW's goal, because unlike UMW members, who work in close-knit teams in dark, dirty and dangerous environments, surface miners man gigantic excavating machines and trucks in relative isolation and face considerably fewer hazards.<sup>26</sup>

The changing nature of coal producers, particularly those in surface mines, is another factor in the declining influence of the UMWA. Whereas most coal companies used to be independent producers, producing coal to be sold in the coal market, many companies today are multinational firms that may be producing coal to sell or may be producing it for their own energy purposes. Many of these companies have the ability to resist and outmaneuver the UMWA. Much of the coal mined by these multinational firms comes from surface mines, particularly those in the west, and these multinational firms are succeeding in operating non-union mines. Their success in resisting union organization has encouraged independent producers to also resist UMWA organization.

In summary, several factors associated with the increase in surface mining over underground mining have combined with other situations to contribute to a loss of UMWA influence and power.

1. The productivity advantage of surface mining has allowed non-union surface miners in the mountain states, an area experiencing large production employment growth, to receive higher wages than union miners. This lessens the need that these surface miners have to belong to the UMWA.

2. The increased safety advantage in surface mines has the same effect on the miner as does the productivity advantage.

3. The traditions of and loyalty to the UMWA are not as strong in western mines and/or surface mines as they are in the eastern underground mines.

4. Surface mining jobs are not like underground mining jobs, so when a surface mine unionizes, the miners sometimes choose to go with a union other than the UMWA. This is particularly true in western surface mines.

5. Many surface mines are owned by multinational firms who choose to resist UMWA organization and have the ability to outlast and outmaneuver the UMWA.

## CHAPTER IV

### CONCLUSIONS

As a result of its loss of influence and power, the UMWA is facing important issues that will affect the future of the union. This chapter takes a look at those issues related to surface mining.

Can the UMWA gain support in surface mines, particularly the fast growing western surface mines, an area where the union has not successfully organized in the past? The UMWA recognizes that it has not had much success organizing surface miners, and it is attempting to deal with that situation.

The UMWA has signed an agreement with the Oil, Chemical and Atomic Workers International Union (OCAW) to share information, and union officials are studying a merger, one with the OCAW or another union. A merger with the OCAW or another union could give the UMWA more clout in its negotiations with multinational corporations, and it could attract surface miners to join the merged union, especially if the union organizes workers with jobs similar to those in surface mining. A merger with another union, one that would attract more surface miners, could help keep the UMWA from becoming a small organization with a large number of pensioners.

The UMWA is also putting more emphasis on organizing surface mines, western surface mines particularly. The union has increased its organizing budget, and it is putting more emphasis on local



and district organizers instead of relying on international organizers.

If the UMWA is successful in increasing its membership among surface miners, it will have a delicate balance between issues important to the underground miner and those important to the surface miner. Surface miners and underground miners are not always in agreement, and the UMWA has faced this situation in the past. While eastern underground miners pushed for a limit on production of low sulfur western coal, the UMWA refused to support this issue, not wanting to alienate the western surface miner. Somehow, the issues important to both the surface miner and the underground miner need to be balanced as the UMWA pushes for more surface miners and for an effective program that will appeal to both.

If the UMWA merges with another union, this balance between divergent groups could become even more crucial.

Two factors could tip the future production balance in favor of underground mining and allow the UMWA to retain its traditional flavor and emphasis. However, since these factors are only possibilities for the future, the UMWA cannot count on them.

One factor is that while surface mines presently produce more coal than underground mines, this situation may not last forever. "Even with the growth of surface mining in recent years, two-thirds of the U. S. reserves can be reached economically only with underground mining methods."<sup>27</sup> Therefore, at some point in the future underground mines may again produce more coal than surface mines.

The second factor is that future technological changes in underground mining may not bring higher productivity. If technological

advances do not bring an increase in productivity, it may have to come through hiring additional skilled underground miners.

If and when the easily recoverable surface reserves are mined and if higher underground mining productivity can come from hiring skilled underground miners, the UMWA could benefit from increased numbers of underground miners. However, waiting for these possibilities could be fatal for the union. Instead of waiting, the UMWA is changing.

In addition to increasing its organizational efforts with western surface miners, affiliating with the OCAW, and considering a merger, the UMWA is attempting to improve its organization. Union officials hope that this improvement will appeal to miners in both underground and surface mines.

The UMWA is changing its image from a corrupt strike-prone organization to a well-managed, tough, and financially sound union.

The UMWA has improved its finances by streamlining its staff and payroll, by improving investments, and by tightening up on spending. It has shown restraint by not calling a general strike during the 1984 labor contract negotiations, thus demonstrating that it realizes many miners want job continuity more than higher wages. It has made job security an issue in its negotiations, and it has concentrated on selective strikes rather than general strikes that alienate many of the new generation of miners.

Can the UMWA survive in the late twentieth century environment or is it an outdated organization made obsolete by many factors, including those related to an increase in surface mining?

The UMWA will survive, not in the same form as the John L. Lewis faithful knew it, but hopefully in a form that is relevant and responsive to present day mining issues. As coal miners themselves have shown that they can survive tough times, so will the union that has united them so many times survive. The UMWA is already changing, not fast enough to suit some and too fast to suit others, but it is adapting to the new circumstances of mining and will develop new traditions to go with those circumstances.

In the future, will the UMWA have the same influence and power it had before? Not even a crystal ball has the answer, but influence and power can be demonstrated in ways other than in long strikes and violent confrontations. Hopefully, the UMWA can have the wisdom to lead a new generation of miners with divergent needs and the miners themselves will have the wisdom to realize that the old way is not necessarily the best way.

## RECOMMENDATIONS FOR FUTURE STUDIES

Future studies related to this paper could include a follow up study to determine trends after 1985. Will surface mining continue its dominance over underground mining in percentage of national coal production? If that dominance continues, will it continue for the reasons detailed in this paper? If underground mining regains the larger share of national coal production, what are the reasons for that change?

Effects of future changes on the United Mine Workers of America could also be studied. If the UMWA succeeds in regaining its dominant influence among miners, an interesting study could be done on the reasons for the UMWA resurgence.

Research on surface mines in the Powder River Basin could contribute to a more detailed understanding of why western surface mines have such higher productivity averages than do other mines and how those averages affect surface mining in general.

## FOOTNOTES

<sup>1</sup>Curtis Seltzer, Fire in the Hole: Miners and Managers in the American Coal Industry (Lexington: The University Press of Kentucky, 1985), p. 5.

<sup>2</sup>"NCA Predicts Production Record in 1987," Coal Age 92 (January 1987): 17.

<sup>3</sup>Seltzer, Fire in the Hole: Miners and Managers in the American Coal Industry, p. 2.

<sup>4</sup>*ibid.*, p. 8.

<sup>5</sup>*ibid.*, p. 10.

<sup>6</sup>Richard P. Schmidt, Coal in America: An Encyclopedia of Reserves, Production and Use (New York: McGraw-Hill, 1979), p. 175.

<sup>7</sup>*ibid.*, p. 196.

<sup>8</sup>Charles R. Perry, Collective Bargaining and the Decline of the United Mine Workers (Philadelphia: University of Pennsylvania, 1984), p. 17.

<sup>9</sup>*ibid.*, p. 10.

<sup>10</sup>"NCA Predicts Production Record in 1987," 17.

<sup>11</sup>Schmidt, Coal in America: An Encyclopedia of Reserves, Production and Use, p. 158.

<sup>12</sup>U. S. Department of Energy, Energy Information Administration, Coal Production 1985, DOE/EIA-0118(85), 1986, pp. 55-56.

<sup>13</sup>*ibid.*

<sup>14</sup>Schmidt, Coal in America: An Encyclopedia of Reserves, Production and Use, p. 245.

<sup>15</sup>Larry T. Adams, "Changing Employment Patterns of Organized Workers," MLR Monthly Labor Review 108 (February 1985): 25.

<sup>16</sup>U. S. Department of Commerce, U. S. Bureau of the Census, Statistical Abstract of the United States 1985 (Washington, D.C.: U. S. Government Printing Office 1986), p. 424.

25. <sup>17</sup>Adams, "Changing Employment Patterns of Organized Workers,"

<sup>18</sup>*ibid.*, p. 27.

<sup>19</sup>"Companies are Facing a Leaner, More Effective UMW," Coal Age 90 (July 1985): 14.

<sup>20</sup>Standard and Poor's, Industry Surveys (New York: Standard and Poor's Corporation, 1987), p. R-50.

<sup>21</sup>David Brezovec, "UMW Consolidates its Hold," Coal Age 91 (June 1986): 117.

<sup>22</sup>U. S. Department of Labor, Bureau of Labor Statistics, Industry Wage Survey: Bituminous Coal, July 1982, 768-C-1, 1984, p. 3.

<sup>23</sup>*ibid.*, p. 4

<sup>24</sup>Perry, Collective Bargaining and the Decline of the United Mine Workers, p. 37.

<sup>25</sup>President's Commission on Coal, Coal Data Book (Washington, D.C.: U. S. Government Printing Office, 1980), p. 147.

<sup>26</sup>Standard and Poor's, Industry Surveys, p. R-50.

<sup>27</sup>Nicholas Chironis, "Bureau Seeks Innovations in Productivity and Safety," Coal Age 92 (February 1987): 48.

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